

CHAPTEE XII

THE TEMPERATURES IN THE PRODUCER

As in the previous calculations the reaction temperature desired is taken at 1150° from the researches of Harries, the gas in the reaction zone, therefore, for a moment possesses this temperature. In rising, however, it comes into contact with fresh fuel, to which it must give up heat, whereby it naturally is correspondingly cooled. The available heat which this gas receives in the reaction zone has in the main to fulfil the following four functions :—

- (1) It must cover the loss of heat resulting from radiation and conduction.
- (2) It must raise the fresh fuel to the reaction temperature.
- (3) It must drive off the distillation gas from the fuel.
- (4) It must remove the humidity of the fuel.

The total amount of heat for the functions 2 to 4, as well as the distribution of heat to the individual items, does not admit of being laid down in general, since the amount of heat utilised therefor naturally is dependent throughout on the nature of the fuel employed.

As a source of heat, only the available heat of the steam-air gas is at disposal; thus it is necessary in each case to know

the ratio $\frac{\text{C for distillation gas}}{\text{C for steam-air gas}} = \frac{a}{b} \cdot \frac{\text{or good gas coal it has been}}{b}$

taken on p. 78 that of a total of 1 kilogramme 0 a mean of 0.88 kilogramme C is allottable to gasification into steam-air gas, from which there results 4.59 cubic metres steam-air gas which, at $1,150^{\circ}$, must take up $4.59 \times 0.3515 \times 1,150 = 1,855$ calories.

Calories

1. Hereof is for item 1, i.e., for covering the loss by radiation and conduction arbitrarily taken at 5 per cent. 90
 2. The fuel which reaches the reaction zone, i.e., 0.88 kilogramme C, which must be heated up to $1,150^{\circ}$, thus requiring 0.88×313 calories.....
= 275
- Carried forward.....365